AMENDMENTS TO THE SPECIFICATION

Page 4, delete the first full paragraph and insert the following paragraph:

Consequently, the displacement between the detected face-deflection, which is detected by the transmission-type laser sensor, and the actual face-deflection of the reel will be arisen, and the detection accuracy of the face-deflection of the reel thus will be dropped. Therefore, there has been required ~~that the~~ an optical sensor which does not ~~causes~~ cause such problems even if it is applied to the ultrasonic-welding apparatus, i.e., the optical sensor for an ultrasonic-welding apparatus.

Page 4, delete the second full paragraph and insert the following paragraph:

Moreover, since a cover for preventing the dispersion of the noise accompanying ~~with~~ the ultrasonic excitation or the dust under welding is arranged on the ultrasonic-welding apparatus so that the part ~~relate~~ related to the welding, the work piece, mounted on the cradle will be covered. Thus the visual checking whether or not the reel is rotating normally during face-deflection measurement cannot be carried out.

Page 6, delete the first full paragraph and insert the following paragraph:

In the present invention, the ultrasonic-welding apparatus, in which the operations of the face-deflection measurement of the work piece after welding and the ultrasonic-welding can be carried out, is supplied. In this apparatus, since the welding horn leaves from the work piece after welding, the work piece of after welding will be in free condition. Thus, when the laser light, which runs parallel to the welding surface of the work, is irradiated to the work pieces from side direction while rotating the work piece centering on the axis vertical to the welding surface by rotating the cradle, the location and the dimension of the work piece can be measured. As described above, since the work piece is rotating, when the measurement of the fixed position is carried out along the circumference of the work piece, the measurement of the face-deflection, which is caused by the welding will be carried out. Since the work piece is rotating, the face-deflection of the work pieces which is caused by the welding will ~~me~~ be measured by measuring the fixed position along the circumference of the work pieces.

Page 7, delete the first full paragraph and insert the following paragraph:

In the present invention of the rotation sensor, the light emitted from the light-emitting ~~mean~~ means is reflected or penetrated at the detecting part, and the light affected by the detecting part is received at the light-receiving part. Since the position of the detecting part is varied by the rotation while receiving light, time unit until the light, which is reflected by the detecting part, is received, and time unit during light-receiving / non-receiving of the light, which penetrated the detecting part, is received are changed. Thus, the rotation of the rotor is detected by the change of these time ~~unit~~ units.

Page 8, delete the first full paragraph and insert the following paragraph:

In the present invention, the light-receiving image affected by the adjusting member is formed by receiving the light, which is interrupted or reflected by the adjusting member. With the first adjusting process, the change of the thickness of the adjusting member by the variation of the light-receiving image is detected, and the position around the axis vertical to the light emitting direction of the light-emitting ~~mean~~ means and the light-receiving ~~mean~~ means to the adjusting member is adjusted. Then, with the second adjusting process, the change of the limit position of the adjusting member is detected by the variation of the light-receiving image, and the position around the axis parallel to the light emitting direction of the light-emitting ~~mean~~ means and the light-receiving ~~mean~~ means to the adjusting member is adjusted.

Page 11, delete the first full paragraph and insert the following paragraph:

The lower reel 55 has the shape of disk, and a circular opening 55a through which the smaller cylinder part is inserted is formed at the center thereof. The rib 55b for welding is provided among the upper surface of the edge part of the opening 55a. An annular rib 55c is provided protrudedly at the lower surface of the edge part of the opening 55a so that a welding horn 20a is pressed and receives the vibration of ~~a~~ an ultrasonic wave, and ~~transmit~~ transmits the pressure to the rib 55b at the time of ultrasonic-welding.

Page 11, delete the third full paragraph and insert the following paragraph:

In the ultrasonic-welding apparatus 1, the reel 50 is manufactured by welding the upper reel 51 and the lower reel 55 together using ~~a~~ an ultrasonic-wave. As shown in FIG. 2, the ultrasonic-welding apparatus 1 is composed of a cradle 10, a welding unit 20, a transmission-type laser sensor ~~devise~~ device 30, a cover 40, and a control unit (not shown).

Delete the paragraph bridging pages 12-13 and insert the following paragraph:

Since the cradle 10 having above described construction is used not as only a table for welding the reel 50 but as table for measuring the face-deflection of the reel 50, a mounting surface 12a of the mounting part 12, a bottom surface 12b of the rotating table 11, and a sliding surface 16b of the fixed table 15 are treated so as to having the very sufficient accuracy, respectively. The face accuracy of the mounting surface 12a thus serves about within 2 micrometers, on the condition that the rotating table 11 and the fixed table 15 are combined together. A bottom surface 12b and a sliding surface 16b, at which the sliding rotation of the rotating table 11 and the fixed table 15 are carried, is also treated so as to ~~serves as~~ provide the same face accuracy.

Page 13, delete the first full paragraph and insert the following paragraph:

In the conventional welding apparatus used for the reel manufacturing, the rotating table 11 is supported by the angular contact ball bearing, which can ~~receives~~ receive the load toward the radial and one direction of the axial direction, instead of the sliding rotation between the bottom surface 12b and the sliding surface 16b.

Delete the paragraph bridging pages 13-14 and insert the following paragraph:

As shown in FIGS, 1 and 2, a welding horn 20a is provided at the end part of a welding unit 20 toward the cradle 10. The welding of the lower reel 55 and the upper reel 51 together is achieved using the frictional heat on the condition that the reel 50 is sandwiched between the welding horn 20a and the cradle 10. The friction heat used in this welding is caused by the vibration between the lower reel 55 and the upper reel 51, which is caused by the ~~hearing pan~~ welding horn. The welding horn 20a has a diameter which contacts annular rib 55c of a reel 50,

and the operations of which, such as the ups and downs of the welding horn 20a, the generation of ~~supersonic~~ an ultrasonic wave, and the press, are carried out by the command signal from the not drawn control unit connected to the welding horn 20a.

Page 14, delete the first full paragraph and insert the following paragraph:

As shown in FIGS. 1 and 2, a transmission-type laser sensor ~~devise~~ device 30 is composed of a light-emitting part 31 and a light-receiving part 32, and which are arranged face to face each other.

Page 14, delete the second full paragraph and insert the following paragraph:

In the transmission-type laser sensor ~~devise~~ device 30, when some kind of objects are exist between the light-emitting part 31 and the light-receiving part 32, the shadows of the objects are detectable in the light-receiving part 32. The presence or absence of objects, and a position and a dimension of objects thus can be measured by this transmission-type laser sensor ~~devise~~ device 30.

Delete the paragraph bridging pages 14-15 and insert the following paragraph:

In the ultrasonic-welding apparatus 1 according to the present preferred embodiment, for measuring the face-deflection of the reel 50 which are formed by the welding, the location of the light-emitting part 31 and the light-receiving part 32 are determined at both ~~side~~ sides of the reel 50. In this location, the laser light, which is irradiated toward the same height range as the height of the contacting part 52b(welding surface), and light flux of which has a face parallel to the rotation axis 17 of the said cradle 10, and which runs parallel to the welding surface, can be irradiated.

Page 15, delete the first full paragraph and insert the following paragraph:

In the preferred embodiment of the present invention, the transmission-type laser sensor ~~devise~~ device 30 is arranged so that laser light irradiated from the light-emitting part 31 will pass through the constant position near the periphery of the flange part 53 and the lower reel 55 of the reel 50.

Page 16, delete the first full paragraph and insert the following paragraph:

The left cover 40a has an inwall 46 therein. A ~~two~~ pair of air ~~nozzle~~ nozzles 47 and 47 for spraying pressurized air toward welding area are arranged on the inwall 46. An electricity remover 48 for removing the electricity by spraying an air containing an ion toward welding area of above the air openings 47, 47 is also arranged on the inwall 46. A suction hole 49, to which the suction pump (not shown) is connected, and which discharges the air in the cover 40, and which has a cylindrical shape, is arranged at the peripheral wall 43. At the inward of the right-side cover 40b, a guide plate 13 for leading the air to the suction hole 49 is provided aslant toward the suction hole 49.

Page 17, delete the second full paragraph and insert the following paragraph:

Before operating the ultrasonic-welding apparatus 1, the inclination of the transmission-type laser sensor ~~devise~~ device 30 is finely adjusted by the operation of fine-adjusting devices, such as a swivel stage, so that the laser light, light flux of which forms a face parallel to the rotation axis 17, and which runs parallel to the welding surface, can be irradiated. With the present preferred embodiment, the inclination of the transmission-type laser sensor ~~devise~~ device 30 is adjusted so that the light flux of the laser light forms a face parallel to the rotation axis 17, however, it may be acceptable that the inclination of the transmission-type laser sensor ~~devise~~ device 30 is set at a fixed inclined angle as long as it is always used at the same inclined angle.

Delete the paragraph bridging pages 18-19 and insert the following paragraph:

In the transmission-type laser sensor ~~devise~~ device 30, the distance L1 from the upper limit of a light-receiving pattern to the lower limit of the shade D1 and the distance L2 from the lower limit of a shade D1 to the upper limit of a shade D2 is calculated. This calculation is continuously performed while the reel 50 is rolled into a 360-degree roll. Thus, the change of width L1 is outputted as the face-deflection. Also, the value of L2 is outputted as a dimension, and the change of width L2 is outputted as a deflection of flange spacing.

Page 20, delete the first full paragraph and insert the following paragraph:

Since the face-deflection and the dimension of the work pieces are measured by irradiating the laser light which runs parallel to the welding surface using the transmission-type laser sensor ~~devise~~ device 30, the transmission-type laser sensor ~~devise~~ device 30 can be established in the both side of the work piece. The operations, such as the mounting and dismounting of the work piece, are not disturbed. Therefore, the manufacturing of the work piece can be carried out without giving damage thereon.

Page 24, delete the third full paragraph and insert the following:

As shown in FIG. 7, for detecting the rotation of the reel 70, a plurality of the same shaped depressions 73b are formed on the inside 73a of the flange part 73 at equal intervals of a predetermined angle. As for the depressions 73b, the depth from inside 73a is about 0.2 mm, and it is used for escaping the air trapped between magnetic tapes when a magnetic tape are wound on the reel 70. The shape of the depression is selected after due consideration of the blazonry and the poshness of the reel 70.

Delete the paragraph bridging pages 26-27 and insert the following paragraph:

The light emitter 101a has a visible-light semiconductor laser oscillator (not shown), and emits laser light toward the depression 73b and the inside 73a of the upper reel 71 from the emitting face 101d of the case 101c. The laser light emitted ~~form~~ from the light emitter 101a penetrates the transparent lower reel 75, and then reflected by the depression 73b or the inside 73a of the flange part 73 of the upper reel 71. The reflected laser penetrates the transparent lower reel ~~55~~ 75 again, and then received by the light receiver 101b.

Delete the paragraph bridging pages 27-28 and insert the following paragraph:

The amplifier 102 controls the emission/stopping of laser light from the light emitter 101a of the sensor unit 101, and also computes the migration length of the laser light based on the electrical signal, which is outputted from the light receiver 101b of the sensor unit 101. To be more precise, with the amplifier 102, first, the time span from the irradiation of the laser light

by the light emitter 101a to the acceptance of the laser light reflected by the depression ~~53b~~ 73b or the inside ~~57a~~ 73a is measured based on the electrical signal from the light receiver 101b.

Page 28, delete the first full paragraph and insert the following paragraph:

Next, the migration length of the laser light is computed using the measured time span and the irradiation rate of the laser light. Then, the computed migration length is displayed. The time span is defined ~~that~~ as the time period expended while irradiated laser light from the light emitter 101a is received at the light receiver 101b.

Page 30, delete the second full paragraph and insert the following paragraph:

When the detection of the rotation of the reel 70 is started, laser light is outputted from the visible-light semiconductor laser oscillator placed in the light emitter 101a of the reflection-type laser sensor device 100, and then laser light is irradiated from the emitting face 101d. The irradiated laser light penetrates the transparent lower reel 75, and reflected by the depression 73b or the inside 73a of the flange part 73. The reflected laser light penetrates the transparent lower reel ~~55~~ 75 again, and then reached to the receiving face 101e of the light receiver 101b.

Delete the paragraph bridging pages 30-31 and insert the following paragraph:

Then, whether or not the reel 70 is correctly rotating is judged based on the migration length displayed on the amplifier 102. When it is judged that the reel 70 is rotating correctly, the measurement of the face-deflection using the transmission-type laser sensor ~~devise~~ device 30 is started.

Page 33, delete the second full paragraph and insert the following paragraph:

As shown in FIG. 8, in the present embodiment, the reflection-type laser sensor device 100 is used as the sensor, which detects the rotation of the reel 70 on measuring the face-deflection. However, it may be used as the sensor, which checks the interrupting part of the reel at the time of positioning of the light-emitting part 31 and the light-receiving part 32 of the transmission-type laser sensor ~~devise~~ device 30. In this case, since the interrupting part of the reel can be set always constant by using the rotation sensor as checking sensor, positioning-control accuracy can be raised more.

Page 33, delete the third full paragraph and insert the following paragraph:

Referring to FIG. 11 through FIG. 14, the transmission-type laser sensor ~~devise~~ device 30, which is an optical sensor for ultrasonic-welding apparatus, will be explained below.

Page 33, delete the fourth full paragraph and insert the following paragraph:

In FIG. 11, a disk tool (~~zig~~ jig) 80 is mounted on the cradle 10 instead of the reel. In the following explanation, the explanation will be carried out on regarding that the reel 50 shown in FIG. 4 is mounted on the cradle 10 instead of the disk tool 80 as occasion may demand.

Page 34, delete the first full paragraph and insert the following paragraph:

In the transmission-type laser sensor ~~devise~~ device 30, for enabling the location control of the light-emitting part 31 and the light-receiving part 32 to the cradle 10 or the reel 50 mounted on the cradle 10, the light-emitting part 31 and the light-receiving part 32 are arranged on the connecting part 33. The connecting part 33 is constructed so that it can rotate around the two axes by the swivel stage 34.

Page 34, delete the second full paragraph and insert the following paragraph:

As shown in FIG. 2, the light-emitting part 31, the light-receiving part 32, and the connecting part 33 of the transmission-type laser sensor device 30 are arranged inward of the cover 40. The controller 35 of the transmission-type laser sensor ~~devise~~ device 30 is arranged at the out side of the cover 40.

Page 34, delete the fourth full paragraph and insert the following paragraph:

The light-emitting part 31 has a visible-radiation semi-conductor laser-oscillation unit (not shown), and emits laser light toward the light-receiving part 32. In the light-emitting part 31, the run direction of the laser light emitted from the visible-radiation semi-conductor laser-oscillation unit is adjusted by the rotation mirror (not shown) of a polyhedron so that it runs toward the reel as ~~an~~ a parallel light through a lens (not shown). The light-emitting part 31 is connected to the controller 35, and is controlled by the controller 35.

Page 41, delete the first full paragraph and insert the following paragraph:

When the adjustment of the light-emitting part 31 and the light-receiving part 32 are carried out, the length of the shade part is set up as the detecting object for adjusting the level of the transmission-type laser sensor ~~devise~~ device 30. The boundary between the light part and the shade part is also set up as the detecting object for adjusting the zero-point of the transmission-type laser sensor ~~devise~~ device 30. The boundary is defined as the length from the origin of the light-receiving to the upper limit of the shade part. The shade part is defined as the area by which laser light was interrupted with the disk tool 80 in light-receiving image.

Page 42, delete the second full paragraph and insert the following paragraph:

A Location controlling method of the optical sensor for ultrasonic-welding apparatus will be explained as follows. In the present preferred embodiment of the adjusting method, the disk tool 80 is used for adjusting the locating condition of the light-emitting part 31 and the light-receiving part 32 of the transmission-type laser sensor ~~devise~~ device 30 (FIG. 11).

Delete the paragraph bridging pages 42-43 and insert the following paragraph:

In the present preferred embodiment, for adjusting the level of the transmission-type laser sensor ~~devise~~ device 30, the following two points are set up as detecting objects. One of two detecting objects is the length of the shade part, which is caused by the interruption of the disk tool 80. Other detecting object is the boundary between the light part and the shade part (the length from the origin of the light-receiving to the upper limit of the shade part), which is used for adjusting the zero-point of the transmission-type laser sensor ~~devise~~ device 30.

Page 43, delete the second full paragraph and insert the following paragraph:

The standard disk thickness and the standard zero-point are set up when the transmission-type laser sensor ~~devise~~ device 30 is established in the ultrasonic-welding apparatus 1. FIG. 13 is a pattern diagram showing the change of the light-emitting range and the light-receiving range of the laser light of the transmission-type laser sensor ~~devise~~ device 30, and the relation between the disk tool 80 and the light-receiving image Ia and Ib affected by the disk tool 80, when the connecting part 33 is rotated around the vertical axis A by the swivel stage 34.

Delete the paragraph bridging pages 43-44 and insert the following paragraph:

After the ultrasonic-welding apparatus 1 is established, the swivel stage 34, the connecting part 33, the light-emitting part 31, and the light-receiving part 32 of the transmission-type laser sensor ~~devise~~ device 30 are arranged at the predetermined position of the ultrasonic-welding apparatus 1. Following to this arrangement, the reflection-type laser sensor device 100 is arranged. At this time, the cradle 10, the swivel stage 34, and the connecting part 33 are arranged using the level so that the levelness of them are achieved.

Page 45, delete the first full paragraph and insert the following paragraph:

Then, adjusting to the selected angle by rotating the first moving handle 34f, and then fasten the first moving stage 34b by fastening the first fixing handle 34g. The length of the selected shade part having the most shortest length is stored as the standard disk thickness, which is corresponding to the standard of the level in the transmission-type laser sensor ~~devise~~ device 30 (the length of the shade part Ib4 of the of the light-receiving image Ib shown in FIG. 13).

Page 45, delete the second full paragraph and insert the following paragraph:

Next, the setup of the standard zero-point is carried out. As described above, each part of the ultrasonic-welding apparatus 1 and the transmission-type laser sensor ~~devise~~ device 30 are arranged with levelness. The light-emitting part 31 and the light-receiving part 32 are arranged having the perpendicularity to the top-face 80a and the undersurface 80c of the disk tool 80. Then, the boundary between the light part and the shade part at this time is recorded as the

standard zero-point (the boundary Id5 of the light-receiving image shown in FIG. 14), which is the zero-point in the transmission-type laser sensor ~~devise~~ device 30.

Delete the paragraph bridging pages 47-48 and insert the following paragraph:

As the adjusting method of the optical sensor for the ultrasonic-welding apparatus, the adjusting method of the transmission-type laser sensor, that is, the method for adjusting the location of the light-emitting part 31 and the light-receiving part 32 of the transmission-type laser sensor ~~devise~~ device 30, will be explained along the flow chart of FIG. 15. FIG. 15 is a flow chart explaining the method for adjusting the location of the light-emitting part 31 and the light-receiving part 32 of the transmission-type laser sensor ~~devise~~ device 30.

Page 48, delete the first full paragraph and insert the following paragraph:

When the ultrasonic-welding apparatus 1 is operated and the reel 50 is manufactured, the face-deflection measurement of the reel 50 is carried out. In order to maintain the measurement accuracy of face-deflection measurement of the reel 50 for high accuracy, location control of the light-emitting part 31 and the light-receiving part 32 of the transmission-type laser sensor ~~devise~~ device 30 is carried out every predetermined terms, for example, every one weeks.

Delete the paragraph bridging pages 50-51 and insert the following paragraph:

When the location of the transmission-type laser sensor ~~devise~~ device 30 is shifted at angle β around the parallel axis B as shown in FIG. 14, since the central axis of the light-receiving image becomes angle (90-β) to the top-face 80a and the undersurface 80c of the disk tool 80, the origin of the light-receiving image is approached to the upper limit of the shade part.

Page 51, delete the last full paragraph and insert the following paragraph:

In this adjusting method, the light-emitting part 31 and the light-receiving part 32 are adjusted to the same location as the time of setting of the standard disk thickness and the standard zero-point. The measurement accuracy of the face-deflection to the reel 50 by the transmission-type laser sensor ~~devise~~ device 30 is maintained with high precision. Furthermore, since the interrupting part of the disk tool 80 is fixed using the spot 80b and the reflection-type laser sensor device 100, location control is achieved with high precision.

Please amend the Abstract of the Disclosure as follows:

~~To provide the~~ An ultrasonic-welding apparatus, which can ~~attain the above-mentioned requirement, and which can~~ automatically achieve ~~both~~ measurement of the face-deflection the work piece after welding and during the welding of work pieces, such as a reel for a magnetic tape. ~~According to the present invention there is provided an~~ The ultrasonic-welding apparatus ~~comprising;~~ includes: a cradle, onto which two types of work pieces ~~of~~ to be welded ~~and welded to~~ are mounted in piles, and which can rotate around ~~the~~ an axis vertical to the welding surface of ~~said work-piece of~~ a workpiece to be welded; a welding ~~hone~~ horn, which carries out welding using ~~a supersonic~~ ultrasonic vibration wherein ~~in the condition of having sandwiched~~ the two work pieces are sandwiched ~~between said~~ by the cradle; and a transmission-type laser sensor which measures the fixed part of the work pieces, after welding, by the irradiation of ~~the~~ laser light which runs parallel to the welding surface, ~~and the transmission-type laser sensor measure the fixed part of the work piece after welding, which is~~ wherein the workpieces are rotating on the cradle~~, in the condition that~~ and the welding ~~hone~~ horn is apart from the work ~~piece of after welding~~ pieces.